

Main Injector Note #0222  
Recycler Instrumentation: Detector and Electronics Locations  
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This note is intended to provide information on the installation locations for the Recycler Ring diagnostics, both detectors and electronics. Table 1 lists the detectors, other than BPMs, with their approximate locations and longitudinal sizes.

#### Beam Position Monitors (BPMs)

There are 416 split-plate BPMs planned for the recycler detectors. There will be 2 detectors per half cell. The electronics for MI-10 through MI-50 will be located in the same racks as the main injector BPM systems. A typical rack layout is included as figure 1. At MI-60 the electronics will be located in the NW control interface room in rack MI60211, with the layout shown in figure 2.

#### DCCT

One detector (figure 3), 18" flange to flange, in the MI-30 straight section, with electronics located in MI-30 in rack MI30114 (figure 1).

#### Toroids

There are 6 toroids associated with the recycler. One Pearson model 2854 with a ceramic gap will be installed in the main injector near quad 304. This assembly will be 12" flange to flange. A sketch appears as figure 4. The other five assemblies, shown in figure 5, are Pearson model 3100s with ceramic gaps. These are 11" flange to flange and are located near quads 400 and 204 in the recycler, 706 and 906 in the transfer lines, and one in the recycler abort line.

## Schottky Detectors

Two detectors, one horizontal and one vertical, 43" flange to flange, located in the MI-30 straight section with electronics located in MI-30 in rack MI30114 (figure 1).

## Resistive Wall Monitor

One pickup, 40" flange to flange, recommend it be located in the MI-60 straight section with cables brought up to the MI-60 control room, terminated at rack INST1. This would put it in close physical proximity to the LLRF systems, markers and control system consoles.

## Wideband Pickups

Two detectors, one horizontal and one vertical, 62.5" flange to flange, recommend they be located in the MI-30 straight section with cables brought up to the MI-30 electronics room, terminated at rack MI30120.

## Ion Profile Monitors

Two detectors, one horizontal and one vertical, 18" flange to flange, recommend they be located in the MI-40 straight section with electronics located in MI-40 in racks MI40118 and MI40119 (figure 6).

Table 1: Recycler Instrumentation Locations

Detector	Detector Location	Electronics Location	Length (flange to flange)
DCCT Pickup	MI-30 Region	MI30114	18" (Fig. 1)
Toroid I:TOR304	Near MI Quad 304	MI-30	12" (Fig. 2)
Toroid R:TOR706	Near Transfer Line Quad 706	MI-30	11" (Fig. 3)
Toroid R:TOR906	Near Transfer Line Quad 906	MI-30	11" (Fig. 3)
Toroid R:TOR003	In RR Abort Line	MI-40	11" (Fig. 3)
Toroid R:TOR400	Near RR Quad 400	MI-40	11" (Fig. 3)
Toroid R:TOR201	Near RR Quad 201	MI-20	11" (Fig. 3)
Resistive Wall Monitor	MI-60 Region	MI-60 CR	40"
Horiz. Wideband Pickup	MI-30 Region	MI30120	63"
Vert. Wideband Pickup	MI-30 Region	MI30120	63"
Horiz. Ion Profile Monitor	MI-40 Region	MI40118	18"
Vert. Ion Profile Monitor	MI-40 Region	MI40119	18"
Horiz. Schottky Detector	MI-30 Region	MI30114	43"
Vert. Schottky Detector	MI-30 Region	MI30114	43"

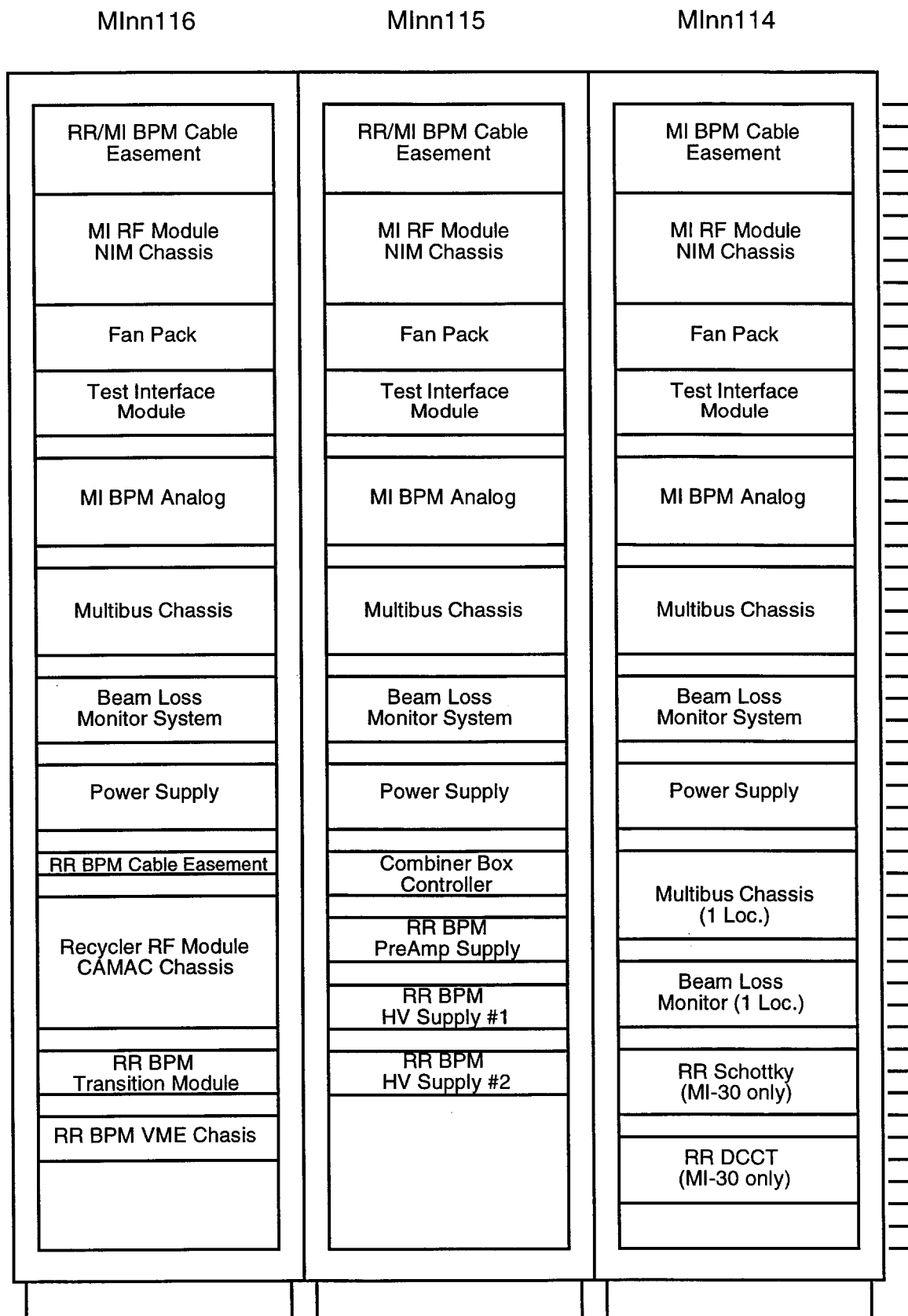


Figure 1: Typical Main Injector/ Recycler BPM Rack Layout

MI60211

MI60212

MI60213

MI60214

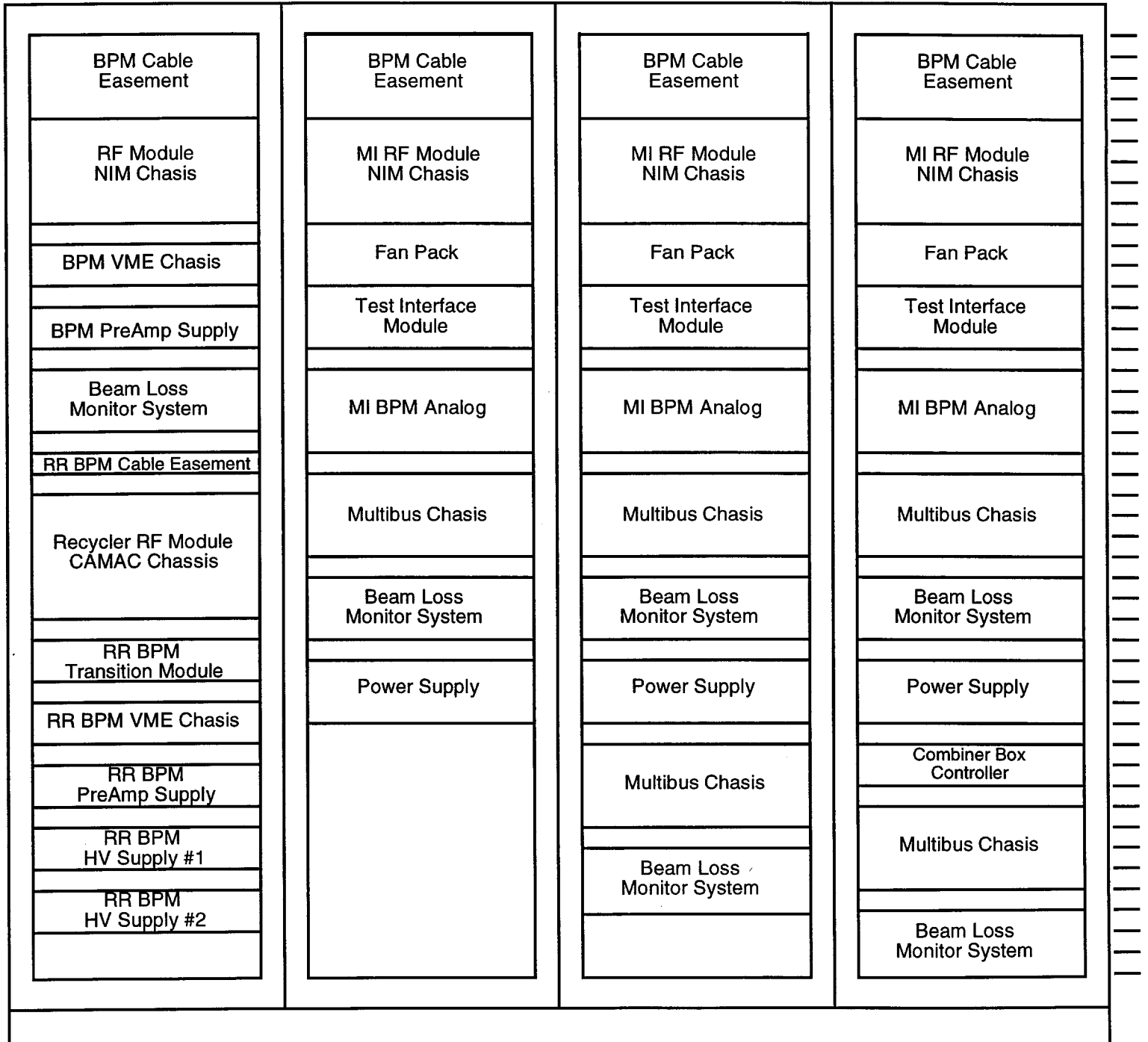


Figure 2: Main Injector/Recycler BPM/BLM Rack Layout (MI-60 NW)

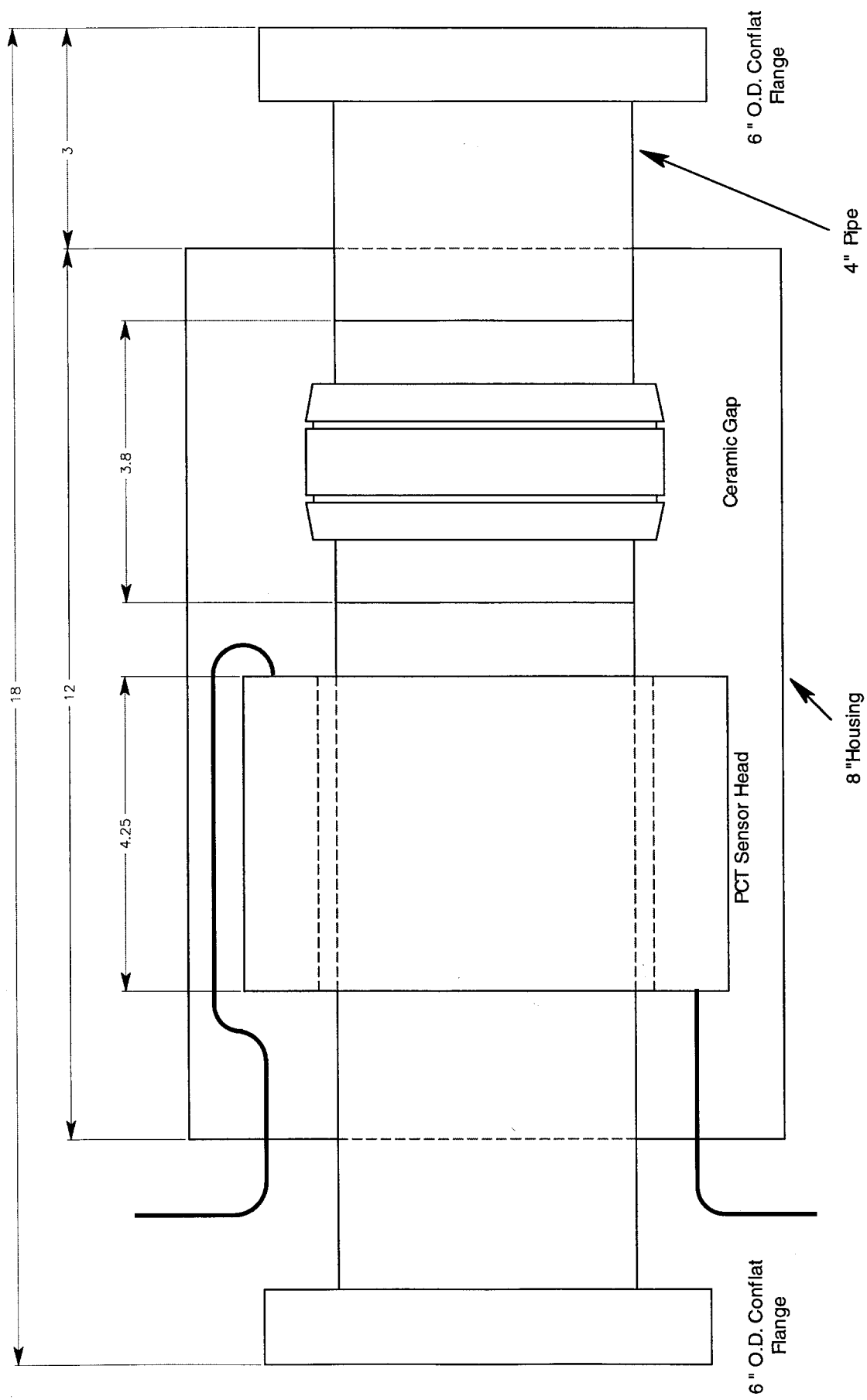


Figure 3: Recycler DCCT Assembly

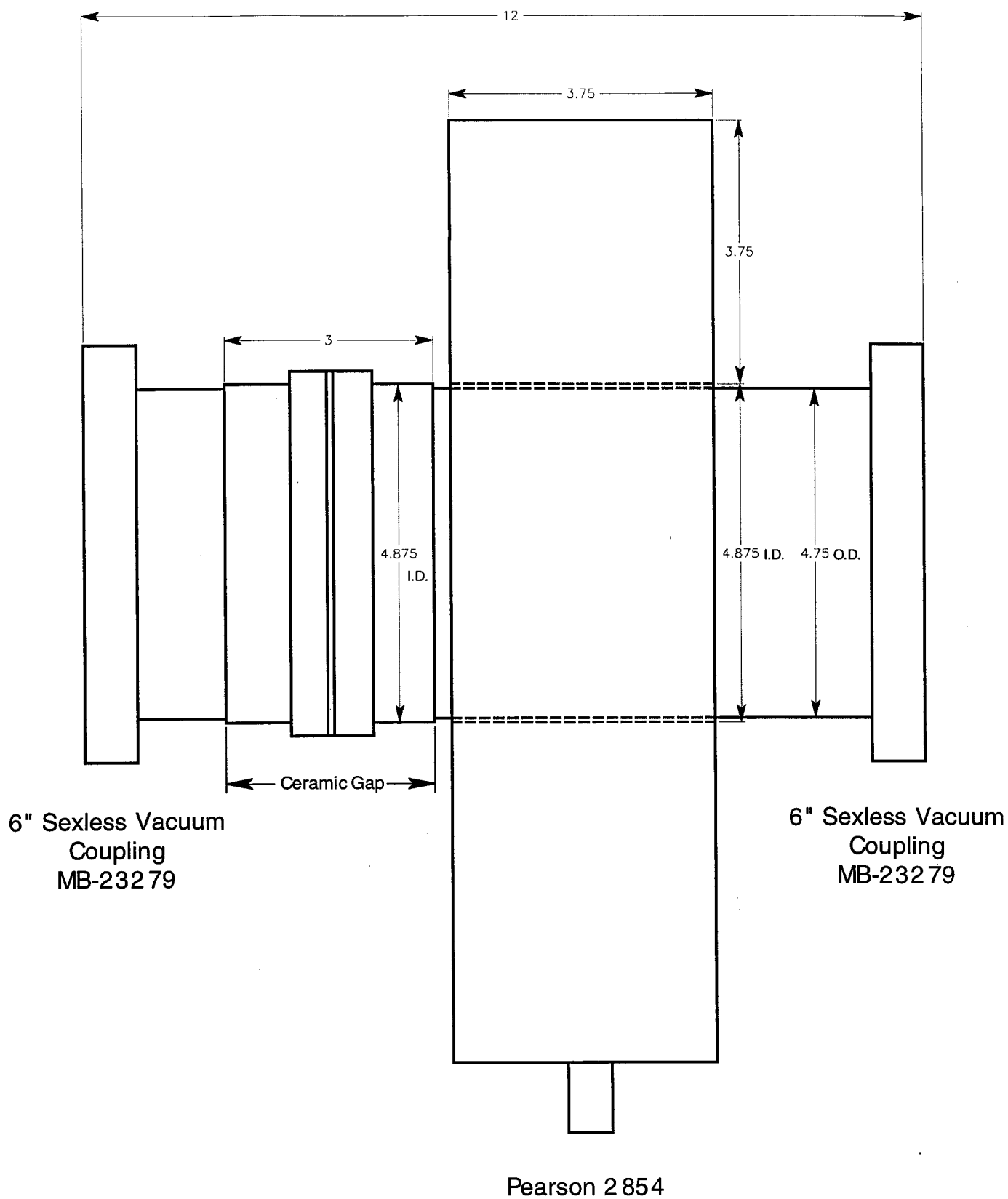
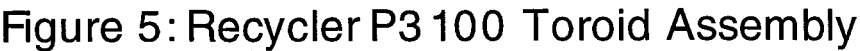


Figure 4: Recycler P2854 Toroid Assembly



### Figure 5: Recycler P3 100 Toroid Assembly



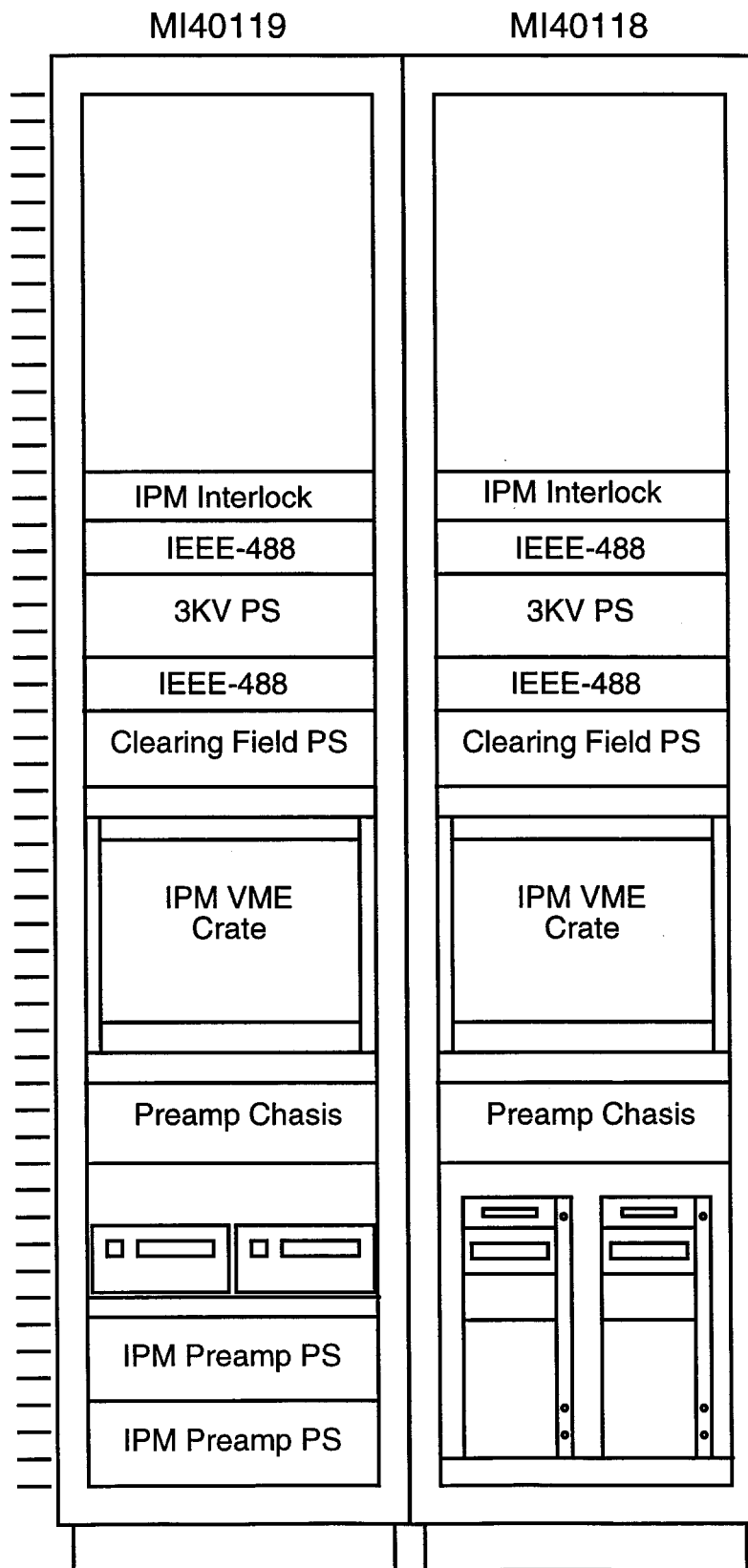


Figure 6: Recycler Ion Profile Monitor Rack Layout (MI-40)